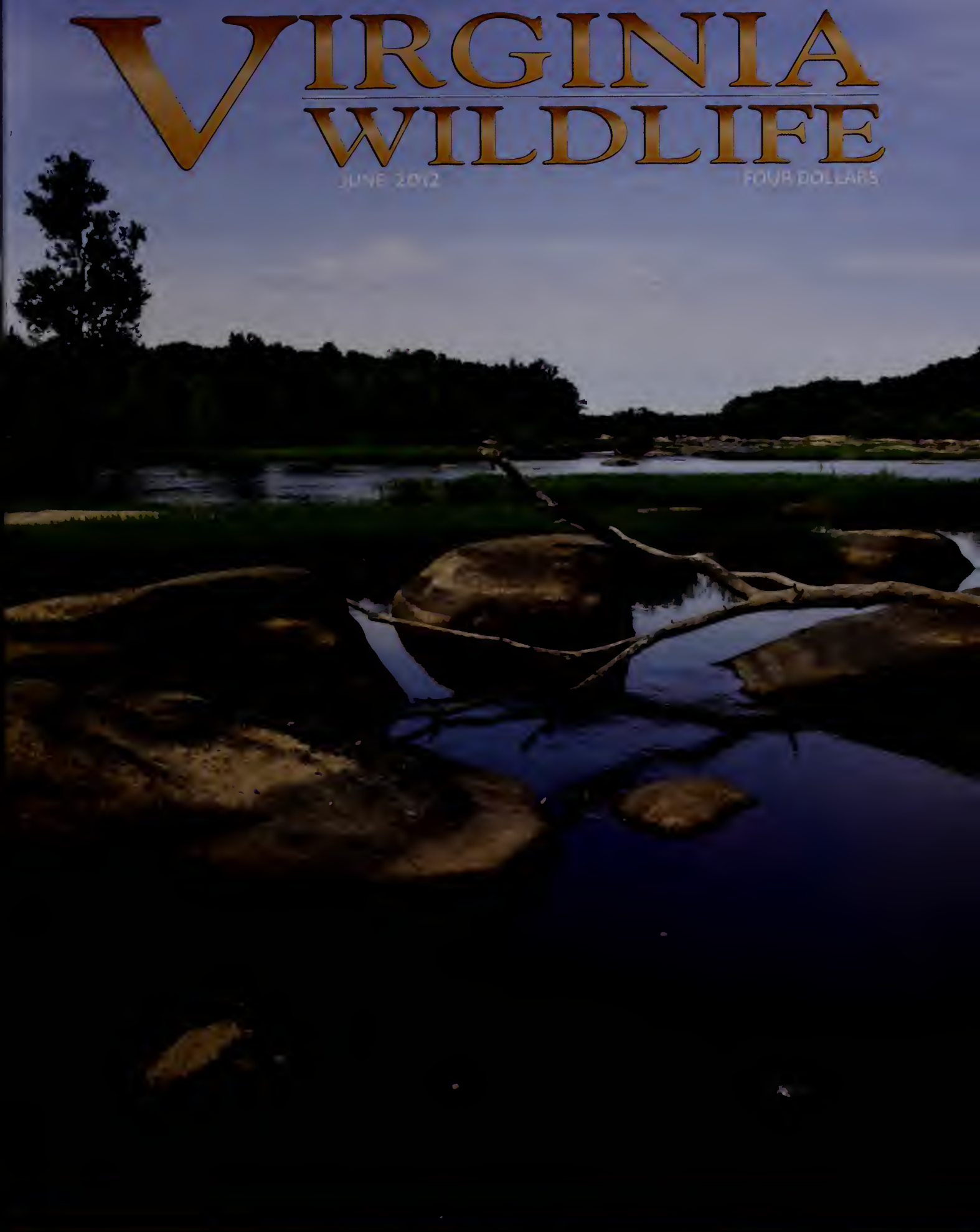
VIRGINIA WILDLIFE

JUNE 2012 FOUR DOLLARS



Macro-invertebrates Rule • K9 Partners • Paradise Creek Redux


JUN

E 2012 CONTENTS



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©Gregory J. Pels

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COVER: June is a great time to visit one of Virginia's magnificent rivers! © Dwight Dyke



BOB DUNCAN
Executive Director

This issue of *Virginia Wildlife* covers a variety of seasonal topics, several having to do with fisheries. One in particular, by Marie Majarov, focuses upon the importance of macro-invertebrates to stream health and shines a light on the many volunteers across Virginia who perform water sampling for these indicator species. Just remember, "inverts" are the backbone of the animal world! The feature about Casting for Recovery heralds the fine services of a non-profit organization working to provide therapy through fly fishing to women struggling with the aftermath of breast cancer. All of these stories extol the value of volunteerism.

Also in the June issue is a feature about the Department's new canine (K9) unit—which has recently expanded to five handlers and their canine partners. They have done a superb job in the relatively short time they have been training, and have provided a real boost to our law enforcement division. Watching these dogs work is simply amazing. There is absolutely no denying the bond that forms between each officer and his or her canine partner. I invite you to read the story inside and learn about this remarkable program—how they train to go about the business of tracking people, detecting game, recovering evidence, and educating the public about the mission of this agency.

Public education and outreach are at the forefront of my mind these days. As a result of the 2012 legislative session, we were asked to study several different issues that have engaged our constituents, including how to better address their concerns about exotic animals (following what happened in Ohio last year). Additionally, we have been asked to work with the Fox Hound Training Preserve Association regarding best management practices for those facilities; to identify possible improvements for hunter access to private land, especially on properties with a history of crop damage by wildlife; and to work with localities in Northern Virginia on lyme disease-related challenges.

The most serious follow-up task to the legislative session is one that involves taking a fresh look at our law enforcement practices and policies, while considering strategies to address some of the law enforcement legislation that was introduced, and either carried over or tabled. Our Department and the leadership of our law enforcement division are dedicated to providing the best conservation law enforcement program possible. We will be examining all aspects of what we do and how we do it—including recruitment, training, supervision, and officer priorities, as well as outreach and other division responsibilities.

We have heard the issues. I can assure you we are taking every possible step to provide the type of law enforcement—and public outreach programs—that all Virginians can be proud of.

MISSION STATEMENT

To manage Virginia's wildlife and inland fish to maintain optimum populations of all species to serve the needs of the Commonwealth; To provide opportunity for all to enjoy wildlife, inland fish, boating and related outdoor recreation and to work diligently to safeguard the rights of the people to hunt, fish and harvest game as provided for in the Constitution of Virginia; To promote safety for persons and property in connection with boating, hunting and fishing; To provide educational outreach programs and materials that foster an awareness of and appreciation for Virginia's fish and wildlife resources, their habitats, and hunting, fishing, and boating opportunities.

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Canines
On A Mission

The Department's new K9 team has hit th

by Clarke C. Jones

"We gotta go!" Pointing gun... country road...wife...that's all I hear. We are on our way. We speed south on Route 20. The blue lights are flashing atop the SUV: We are lit up like a Christmas tree.

Up ahead we see a car in our lane. Richard hits the siren. On a two-lane, country road with hills and turns there are few places to pass the slower car. To my amazement, the car in front of us makes no attempt to pull over to the right and ambles on its way. So, I'm thinking, this is how it looks when you're driving an emergency vehicle. I could feel my blood pressure rise with frustration, impatience.

"You never know what people are going to do in front of you," mutters Richard. "I have had people literally stop in the middle of the road on a hill and try to wave me around. Of course, you cannot see what is coming from the other direction in a situation like that, and the person in the car in front of you is looking at you—like there is something wrong with *you*." As if on cue, the driver in front of us stops in the road, and then makes a left turn. I guess the logic here is, "I am only a mile from my house so you'll just have to wait till I get home." Incredible!

Richard steps on the gas and we press on, siren wailing.

Richard is Conservation Police Officer Richard M. Howald, with the Department. Packed into Richard's SUV are Jessica Whirley—an officer (CPO) from Prince Edward County—me, and Scout, a female Labrador retriever. As one of three Labrador retrievers used by the Department of Game and Inland Fisheries (DGIF) to track suspects, Scout also helps find evidence and locate fish or other wildlife that may be in the possession of, or hidden by, a suspected game violator. Right now, all we know is that a gun has been pointed at a citizen and the address where the reported incident has occurred.

When we arrive at the scene, none of the people who were pointing the gun are still around. The alleged victim is not on-site but his angry, upset wife is. The last thing she is thinking about is calming down. If a gun has been pointed at *your* spouse, you can understand why!

Richard and Jessica must begin to build the case to bring an alleged criminal to justice. The woman does not have any license numbers of the vehicles involved. She thinks she knows the identities of some of the people who pointed the gun at her husband, but couldn't swear to it. She says her husband does know. Then she tells the officers what the laws are regarding possession of firearms and hunting along a road. She is wrong. But, of course, she can't be wrong because that is what her husband told her!

Here is where problems occur. So many people—even lifelong hunters—frequently do not know the game laws in their own county. There is not much the officers can do at this point but ask the wife to have the husband call them to try to get more information. About a half-hour later, the husband calls and Jessica speaks to him. He is upset and wants the officers to take action. Jessica explains to him that no *game* laws have been broken and that he will need to speak to the county magistrate and swear out a warrant against the alleged perpetrator for brandishing a firearm. The man does not like this. I can hear his, ahem, displeasure in the comments coming from the phone Officer Whirley is holding to her ear.

It is the job of the conservation police officer to protect not just wildlife, but also the hunter's rights and the landowner's rights. Protecting all three can lead to confusion and frustration. Just before the pointing gun call came in, we had spent over three hours bouncing around the rutted back roads of Cumberland and Buckingham counties, checking for possible game violations. I quickly realized that the life of a CPO is not the glamorous job I thought it was. It is dangerous, tedious, often thankless work requiring patience and diplomacy that few of us have or would tolerate. Employment as a conservation police officer in Virginia may look like something you would want to do, but only a select few can do this job and do it well. It takes exceptional skill and judgment

Sally Mills



CPO Frank Spuchesi with his partner, "Comet," train for evidence recovery with the assistance of CPO Wayne Billhimer.

round running!

to handle non-routine, sometimes life-threatening, events and make them appear routine.

For the CPO, hunting season is not only a busy season; it can also be a holiday season. While you are relaxing at the table with family at Thanksgiving, sitting around a cozy fire on Christmas Day, or planning New Year's celebrations, our CPOs are patrolling in the cold, wind, rain, and snow protecting wildlife, property, and you. And because felons like to work in the dark, the CPO has to be out then too.

When responding to an emergency report, a CPO may have to quickly drive 20 or more miles along winding, rural roads to reach the site of the incident. If you are a CPO with a Labrador, it is not uncommon to be called to a location over two hours from your base. So you not only have to know your territory and the players in it, you must also know all the game laws of the counties in your district, as well as the *state*. Each county has a certain amount of leeway when writing their hunting rules—and the rules are not consistent among localities. During my ride-along



Sally Mills

CPO Wes Billings and partner "Josie" look for an article hidden in the ground, as CPO Wayne Billhimer looks on. Right, CPO Megan Vick works her dog, Jake, during a field exercise.

Courtesy of Conservation Officer Jeff Milner, Indiana Dept. of Natural Resources

A Brief Overview

The Department's K9 program has been generating great results. In fact, the original team of three dogs with handlers (shown right) has recently expanded to five, with the addition of "Comet," handled by CPO Frank Spuchesi, and "Josie," handled by CPO Wes Billings. Colonel Dabney Watts leads the Law Enforcement Division and has only positive things to say about the program.

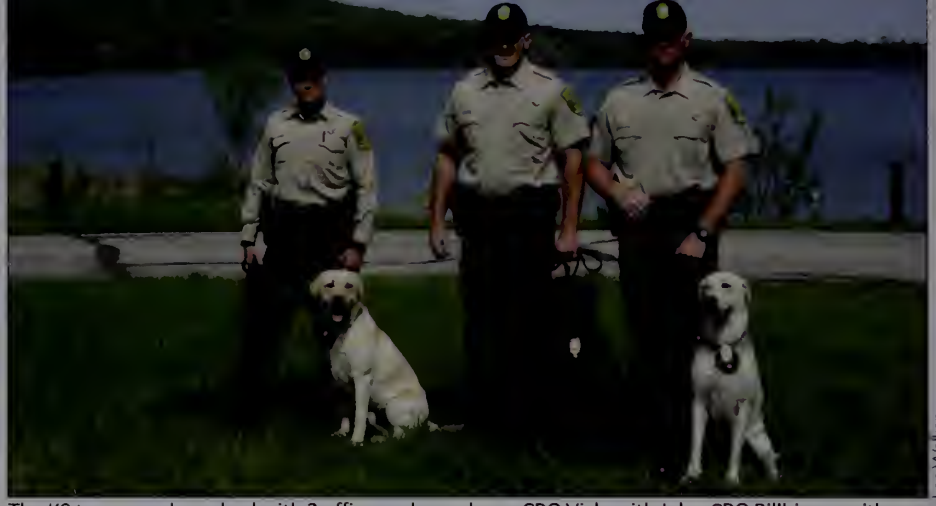
Col. Watts provided some background during a recent interview. He was quick to note that DGIF is indebted to the K9 Academy at the Indiana Dept. of Natural Resources, a 14-year program run by Conservation Officer Jeff Milner, who provided training for these dogs and their handlers at no charge. Other state wildlife agencies assisted, too, by sharing with our CPOs their experiences and lessons learned over the years. Two of the dogs in the first "class" were generously donated to Virginia's program by the Kansas Dept. of Wildlife, Parks and Tourism.

Virginia's K9 Wildlife Team uses sporting breeds. The dogs are trained in three areas specific to the Department's wildlife mission: tracking, wildlife detection, and article/evidence recovery. After an intensive 8-week course, the teams are ready to take on assignments. Each dog knows what is required during a particular operation by the type of collar or harness placed on him by the handler. Likewise, in the field the dog lets the officer know he has discovered something by "alerting" the CPO with a specific body movement. In the case of article recovery, for example, the dog would make a digging motion.

With time and experience, K9 partners become accustomed to working together in the field—a process that can take six to eight months. The biggest, single advantage to the agency is the manpower saved during search (and sometimes, rescue) operations. The K9 team has also proven valuable in educating the public about the work our law enforcement officers perform. Sporting breeds are a good choice for this aspect of the mission, since they are comfortable around people. Officers in the program are available for demonstrations to schools and other groups.

For more information about the program and to make a donation, go to: http://vawildlife.org/k-9.html.

–SHM



Lee Walker

The K9 team was launched with 3 officers, shown here: CPO Vick, with Jake; CPO Billhimer, with Justice; and CPO Howald, with Scout—in partnership with the Wildlife Foundation of Virginia.

with Officers Howald and Whirley, I also began to get a clearer picture of how much "sufficient" evidence a CPO must have to even bring a case to court, much less win it. I also got some sense of the volume of paperwork and reporting required for each incident.

A quiet break for lunch today is out of the question. We drive on, checking out old logging roads and farm roads. As we approach a power line easement, we can see that clover has been planted in the clearing. We look around and discover a blind. The officers make a note of it. Sometimes it's these little discoveries that lead to bigger things.

We approach some woods and stop to give Scout a quick, mandatory training lesson. This must be documented for both DGIF and court records when the evidence of, or pursuit and capture of, an alleged violator involves one of the dogs. Richard places an object in the woods along a leafy, logging road. Scout does not know where it is. Richard paints me the scenario that I have spotted someone in the woods who then takes off when he sees me. I grab Scout, put on his tracking lead, and take off in pursuit. The culprit has hidden himself, thinking there is no way you will find him in these woods with the head start he has on you. But then he sees the Lab following his tracks, coming toward him. About 50 yards away from the officer he bolts and throws something to his right. The officer apprehends the suspect and learns that he is a convicted felon. If the object he threw was a gun, the felon now has bigger issues.

Now the daylight is fading and, in all the commotion, the officer only has a *general* idea of where the object may be. Before the Department's K9 program started in 2011, the officer might have to call in one or two other officers to help search for the weapon, spending time, energy, and the taxpayers' money to help locate it. I have a general idea of where the object is (the object that the felon threw away) and then Officer Howald sends Scout and me to look for it. I immediately go in the direction I think the object is located. Scout just knows she is to look for something. We both walk past it.

I want to outwit the dog in this high-stakes Easter egg hunt and am looking hard in the leaves. Scout comes back to a place we passed and "alerts" at a particular location I have just covered. Richard gives Scout a verbal signal and Scout, by her actions, reinforces the fact that she has found something. Richard then rewards Scout with about five minutes of playtime, which the Lab obviously enjoys. Scout has been trained that her "treat" is play and she will work her hardest for a little playtime with Richard!

The value of these Labs is proven almost every day. Richard tells me of one violator he caught who told him, "I was hoping you were off today. I've heard about you and that dog."

That sentiment is echoed by CPO Megan Vick, who initially proposed—and persuaded—the Law Enforcement Division to consider undertaking a K9 program. Vick did her homework and discovered that other state wildlife agencies with K9 units had experienced great success; yet, the programs are young and there are very few wildlife dog handlers nationwide.

According to Vick, "One of the immediate benefits of this program is the amount of manpower we save. If we are looking for a shotgun or a shotgun shell, it may take the dog six to eight minutes to find it. Without the dog, we would need a team of four to five people to be able to cover the same territory, and

even after hours of work, still may not find what we are looking for." Vick's district covers much of southeastern Virginia and the Eastern Shore—a broad territory and something not uncommon for today's CPOs.

When you think about it, other than a spear, man's first hunting aid was a dog. It helped him track, find, and run down game, and at times, it has acted as an early warning device. Hundreds of centuries later, even with all the technology a CPO has at his or her disposal, we have realized the advantage of reintroducing the dog to again track suspects, find wild game, and uncover evidence.

We continue making the rounds and head off along another country road. We approach a pick-up parked off the asphalt near some woods. Driving past the truck, we follow an old, overgrown farm road deep into Cumberland County. As we turn around a sharp bend we suddenly come upon six hunters with shotguns. They look the way *anyone* looks who is having a party and some uninvited people decide to crash it. Normally, I wouldn't crash a party hosted by people carrying shotguns. Officer Howald tells me to stay in the car as he and Officer Whirley get out to check everyone's license. The two officers chat a bit with the hunters and then ask to see their licenses. It all looks very routine but I could not help but wonder how I would react if I was on patrol alone and found six hunters who may not have been obeying the law. What then?

After the license check, we head back to Cumberland Courthouse and my ride home. CPO Whirley has to prepare for a spotlighting stakeout, meaning she will not go off duty until around midnight—a long day in anyone's book. As I say goodbye to Officers Howald and Whirley, and assistant Scout, I think about special times hunting with my father, or fishing with my friends, and I silently give thanks for the conservation police officers who safeguard our opportunity to make more of those memories in the future.

Clarke C. Jones is a freelance writer who spends his spare time with his black lab, Luke, hunting up good stories. You can read more by Clarke at www.clarkecjones.com.



Whether performing evidence recovery or tracking or wildlife detection, time is a pressing concern. Canine handlers and their dogs must be in top physical condition.

Sally Mills

Winged Invasion



Extolling the virtues of the house sparrow.

by Jason E. Davis



©Maslowski Photo

The house sparrow is at home in just about any setting and might be considered the consummate opportunist.

We've been invaded, but you probably didn't even notice. Those of us living in Virginia, and indeed all across North America, have been living under an occupying force for more than one hundred years now. We see these feathery intruders every day in our yards, in the eaves of our office buildings, darting in and out between cars in the grocery store parking lot, but most of us don't pay them any real attention. But maybe it's time we gave the devil its due. Conquering the world isn't easy, and house sparrows have done it with room to spare.

House sparrows are scrappy, ill-tempered, barbarian birds with an attitude. Because house sparrows have made themselves at home at the expense of native species, they are often looked down upon, even despised, by both bird aficionados and environmentalists. But beneath their drab brown and grey feathers they carry an array of formidable adaptations, including a surprising intellect, an adaptable physiology, and an amazing behavioral flexibility that has helped them to become the most common songbird in the world.

House sparrows (sometimes called the English sparrow, or *Passer domesticus*) are native to Europe and the Near East. As an old world species, house sparrows aren't at all closely related to native North American sparrows. In fact, house sparrows and native sparrow species—such as song sparrows, swamp sparrows, and white-crowned sparrows—aren't even in the same family. House sparrows and their distant American cousins may be generally the same size and color, but the similarities pretty much end there. A closer comparison rapidly reveals a large number of physical and behavioral differences. House sparrows have stubby tails, stocky bodies, and thick, wedge-shaped beaks ideal for crunching seeds. In comparison, native sparrows are generally more slender, with longer, more pointed beaks. House sparrows are distinct in their social behaviors as well: They flock together in large social groupings year-round and don't exhibit the kind of territoriality that can be found in most native sparrows. This set of traits, along with several other somewhat less apparent specializations, has given house sparrows a huge wing-up in colonizing our continent.

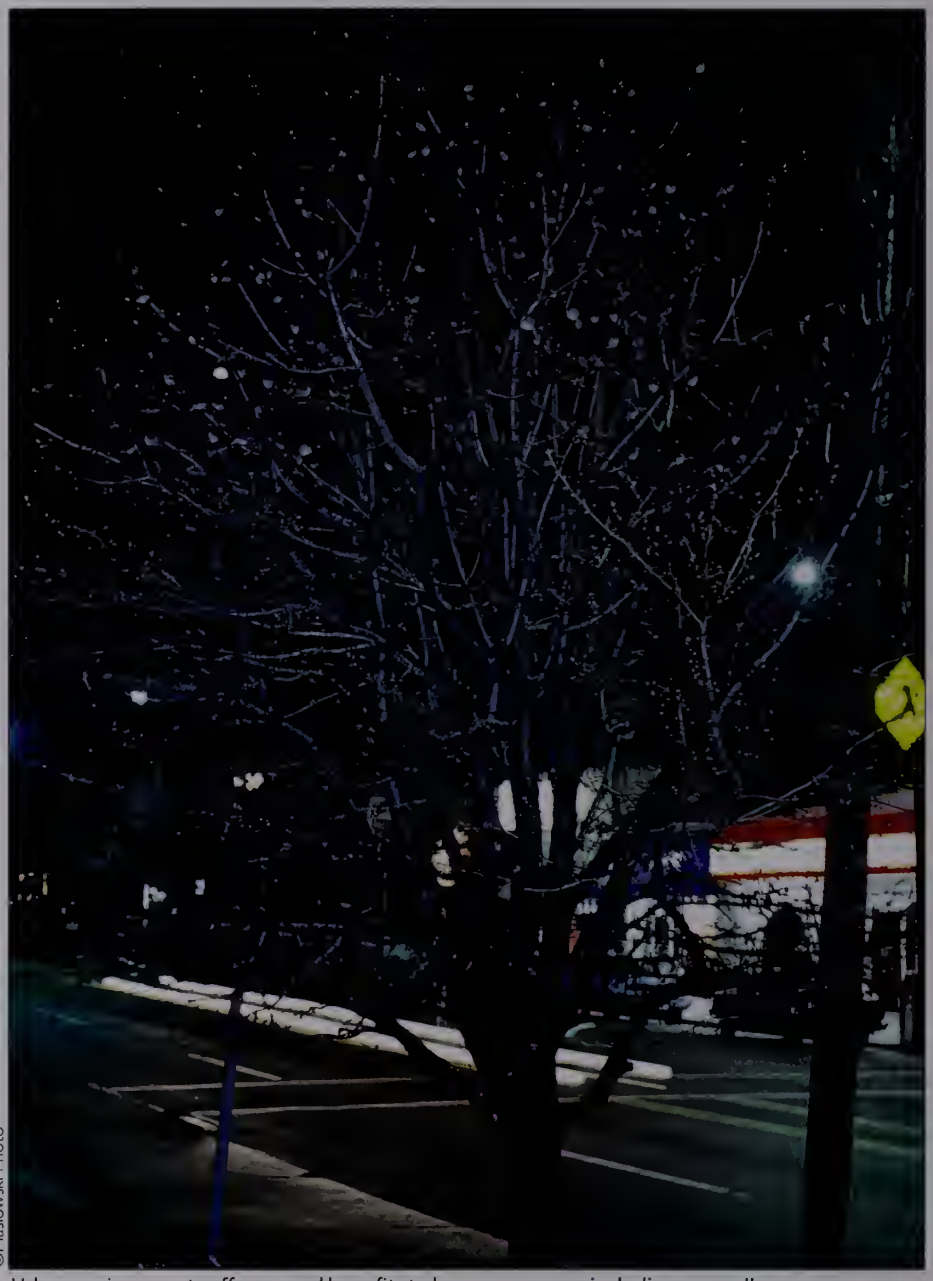


©Maslowski Photo

With a reputation for aggression, house sparrows can intimidate other songbirds.

House sparrows first arrived on North American shores in the mid-1800s. Local farmers released a few dozen birds in Brooklyn in 1851, thinking that the birds would help keep pest insects under control. House sparrows were released several more times at different locations around the country through the 1890s, though it seems unlikely that they helped much with insect management, since the main part of their diet is composed of seeds and grain. Since then, the house sparrow population has bloomed and expanded to the point that recent estimates suggest there are now more than 150 million house sparrows in the lower 48 states alone.

Like feathered mice, house sparrows have made a home for themselves on our streets and alleys. In fact, house sparrows seem to prefer to be near us; they have spread



©Maslowski Photo

Urban environments offer several benefits to house sparrows, including generally warmer average temperatures and plenty of nooks and crannies for raising their young.

alongside us and demonstrate a marked preference for cities and towns over rural areas. This isn't to say that urban areas are easy places to live, even for the scrappy house sparrow. Cities are loud, bright, polluted, and chock full of an ever-shifting array of hazards and challenges. However, if you can stand the stresses of urban life, there are some definite advantages to living in towns. Cities boast warmer average temperatures, multitudinous nooks and crannies that can be used as nesting sites, a general reduction in most natural types of predators and competitors, and a near-constant supply of food from both bird feeders and garbage. It might not be the most glamorous of lifestyles, but being a "rat bird" can certainly pay off.

In the past 30 years, more than a thousand scientific studies have been done on house sparrows. This research has provided substantial insights, not only into the nature of the house sparrow itself, but also into the fundamentals of fields such as endocrinology, immunology, reproductive biology, and ecology. From the house sparrow we have learned that culinary curiosity helps a species to be a successful invader; house sparrows are willing to eat a variety of foods, from old Cheetos to insects to hot dogs to grain to popcorn. Recent research has even shown that, unlike many native songbird species, new populations of house sparrows readily investigate unfamiliar types of food and explore areas far away from cover. This boldness almost certainly gives them an advantage when moving into new environments where familiar resources and refuges may be missing.

House sparrows exhibit a variety of other traits that seem tailor-made for exploitation of an urban environment. Recent studies have shown that house sparrows have particularly strong immune systems, which likely serve them well when feeding in our trash piles and garbage dumps. They are also nonmigratory, a feature that might seem to be a weakness for surviving cold winters, but is actually a strength when they can seek refuge in warm attics and crawlspaces to while-away the winter nights instead of undertaking dangerous and exhausting long-distance travel. House sparrows also have a flexible reproductive system that can easily go into overdrive. In well-provisioned environments house sparrows can hatch out three or more broods per year, compared to many other songbird species that produce at most two broods.

Much like discontented humans, house sparrows often don't make good neighbors, at least not for native bird species. House sparrows have a reputation for belligerence and are often seen fighting with members of their own and other species. Their innate aggression, along with their strong, thick beaks, makes house sparrows a potential threat to



©Rob & Ann Simpson

A strong immune system helps the house sparrow tolerate things like street garbage.



©Maslowski Photo

Like the house sparrow, the Pyracantha shrub (shown here) can thrive in many environments.

other songbirds. House sparrows have been documented stealing nesting sites, harassing adults, and destroying the eggs of native songbirds.

However, despite being equipped for conquest, it is difficult to determine how much of a threat house sparrows actually pose to native bird populations. Areas inhabited by house sparrows often have a less diverse array of other songbird species, but these are also typically areas that have undergone a large amount of human modification. How much of the impact on native populations can be laid at the scaly feet of house sparrows and how much is actually due to direct human intervention is hard to say, but is certainly a question worth investigating further.

Despite all we've learned about them, there are still house sparrow mysteries waiting to be unraveled. Perhaps the greatest of these is why house sparrows do so well in many places, but fare poorly in others. House sparrow populations are waning in their European homeland. In England alone, house sparrow populations have declined by more than 50 percent since 1975. There are a variety of theories regarding the cause of house sparrows' European decline, from changes in agricultural practices, to differences between populations descended from colonists, like those in North America, versus populations descended from homebodies, like those in Europe. However, none of these theories has yet presented a definitive answer.

Regardless of whether you love them or hate them, there can be little doubt that house sparrows are here to stay. The next time you see one, keep in mind that though they may be down and dirty, raucous and pushy, they're actually one of the most interesting things on the wing.

Jason E. Davis is an assistant professor of biology at Radford University. His research focuses on physiological processes in wild animals.



Tiny Aquatic Treasur

An entire army of freshwater creatures supports the fish you love to catch.

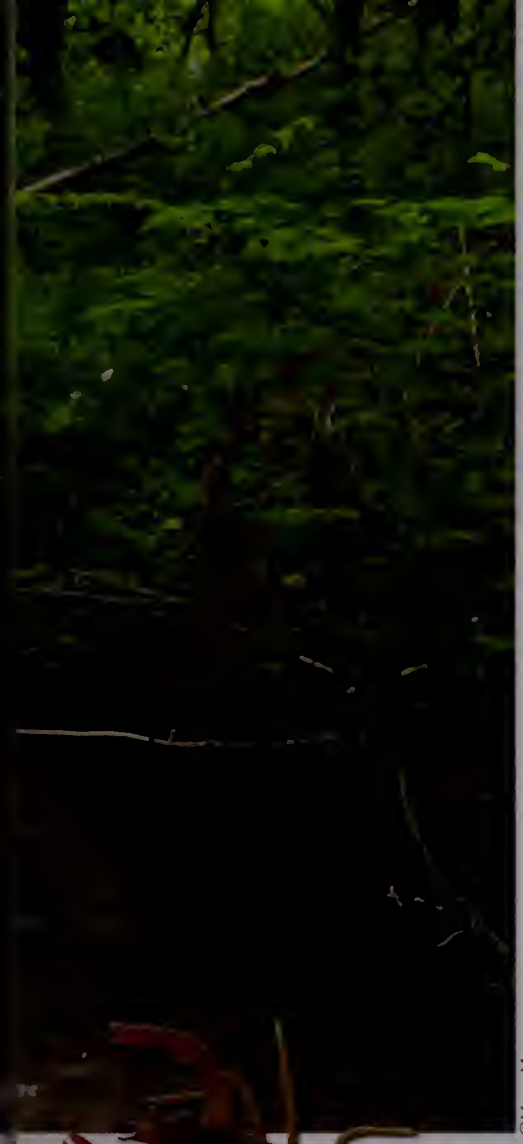
by Marie Majarov

Serious anglers know that the health and vitality of Virginia's native brook trout, smallmouth bass, rainbow trout, and all other fish species, as well as the waters in which they swim, are intricately linked to a fascinating world of wiggly, squiggly, variously shaped critters known as benthic macro-invertebrates (BMIs). But to those of you who don't fish: Their environmental importance is HUGE!

BMIs are quite simply animals that have no backbone, live all or part of their lives in freshwater environments, and are big enough to be seen without magnification; however, they are anything but simple. The word "benthic" comes from the Greek *benqos,* meaning bottom—referring to the bottom of lakes, rivers, and streams where BMIs mostly live. "Benthos," as these little guys are sometimes referred to, range from the tiniest pencil point sized "no-see-ums" to crayfish as big as 6 inches, and number close to 9,000 ingeniously adapted species.

Larval and nymph stage insects, mollusks, worms, leeches, and crayfish comprise the most common BMI found in Virginia's fresh waters.

BMIs are middlemen, an essential link



©Marie Majarov



in the aquatic food chain. In streams, life-sustaining energy and nutrients are found in fallen leaves, algae, aquatic plants, microorganisms, and similarly sized animals—all of which are fodder for BMIs. These necessities pass on to the fish that feed on the BMIs or are released back into the water when the BMI die and decay. Fish forward these nutrients further up the food chain to those that eat them: birds (herons, egrets, bald eagles, kingfishers, for example), raccoons, water snakes, and yes, even fishermen who enjoy a fine fish dinner.

Carl Rettenberger, Winchester Trout Unlimited BMI/fly-tying educator, states that BMIs "are absolutely vital to the survival of our fish. If this food source were lost, our fish would be gone." BMIs have another, lesser known but critically important environmental role: Their presence, absence, or abundance serves as a remarkably effective indicator of water quality and stream health. Fisheries biologist Paul Bugas describes BMI measurements as an "extremely valuable tool" used by the Department (DGIF) in management efforts to preserve precious fisheries and waterways.

A Diverse Assemblage

Classification of BMIs, complex and intriguing, follows a number of dimensions. Only the most basic can be described here. The first is habitat: the fast- or slow-moving, cold or warm waters of seeps, streams, rivers, bogs, marshes, swamps, ponds, and lakes, where the bottom contains a great diversity of materials—from boulders, cobble, pebbles, gravel, sand, silt, and clay, to logs, leaves, detritus, algae, and a variety of aquatic plants. Yes, BMIs are everywhere in our freshwater systems, and they need specific body shapes and methods to maneuver in order to survive in their particular habitat.

"Clingers" have strong legs for holding on and flat bodies that reduce drag from water flow (flathead mayflies and water pennies), while others produce a sticky silk to glue themselves to surfaces in riffles and fast moving streams (non-biting midges). Still others, casemaker caddisflies for example, make intricate cases from pebbles or bits of leaves to attach themselves to rock surfaces.



Hellgrammite

Climbing is another form of locomotion. "Climbers" have spindly legs, (think dragon- and damselfly larvae), an adaption that enables movement up and down aquatic plants to feed and, when ready, to hatch into their familiar, beautiful adult winged form, climb out of the water, and take flight. Climbers are capable of swimming but do so only if necessary, in contrast to "swimmers" like the ameletid minnow mayflies which flex their bodies to actively move themselves through the water or paddle with specially designed legs and tails. Much of the time, though, swimmers remain perched on rocks, pieces of wood, plants, or coarse detritus.

"Crawlers" such as common stoneflies and hellgrammites seek small, protected

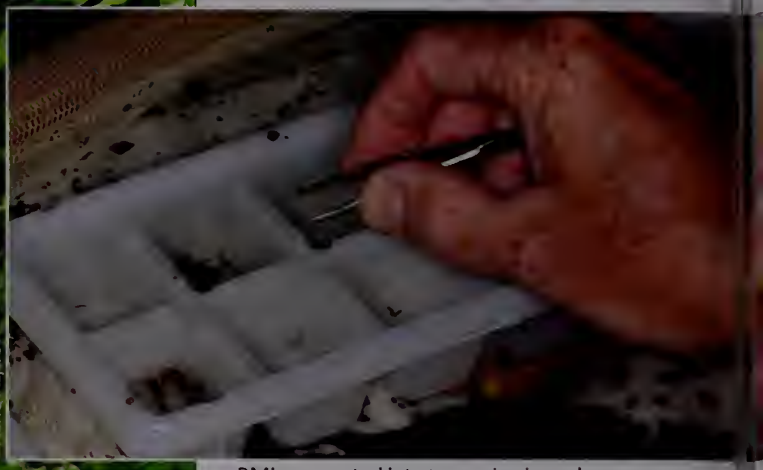


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Shenandoah Chapter VMN and Friends of the North Fork, Shenandoah River carefully sort and count BMIs during a sampling project. Left, Winchester TU members follow Save Our Streams sampling protocol using a kick seine on Redbud Run.



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BMIs are sorted into taxa using ice cube trays filled with stream water. Left, the shadow darner spends its larval stage as BMI, growing and developing under water.

places and crawl slowly, using their legs and tarsal claws. They need firm surfaces unlike the "sprawlers" and "burrowers" (crane flies) which have adapted to move on top of or dig down into fine sediments of sand, silt, and clay. A final, very small group of BMI, "skaters" (think water striders), is uniquely adapted to remain on the surface of slow waters.

BMIs are also classified according to their varied feeding methods. "Shredder-detritivores" (giant stoneflies) feed on large pieces of dead plant material, while "shredder-herbivores" (northern casemaker stoneflies) prefer living aquatic plants. "Collectors" acquire and ingest very small particles of detritus, some with innovative filters such as the nets spun by common net spinner caddisflies. Others, collector-gatherers (non-biting midges and aquatic worms), gather tidbits that are lying on the bottom or mixed with sediment. Algae growing on rocks and hard surfaces provide "scrapers" and "grazers" with a nutritious aquatic salad bar. Still other BMIs use piercing methods to suck fluids: from plants, the "piercer-herbivores" (micro-caddisflies); and from animals, "piercer-predators" (water scorpions). Finally, "engulfer-predators" such as free-living caddisflies, common stoneflies, and dragonflies feed on animals by swallowing them whole or in pieces.

Stress tolerance, or the ability to withstand various types of disturbances (organic pollutants, sediments, and toxicants) in their environment, is perhaps one of the most important dimensions on which to classify BMIs. Some organisms are very sensitive to



©Marie Majarov

Good BMIs make for healthy streams and beautiful fish like this rainbow trout.

©Marie Majarov



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A healthy smallmouth bass is shown to VMN by DGIF fisheries biologist Paul Bugas during an electrofishing demonstration.

pollutants (stoneflies and many mayflies) and their presence, especially in high numbers, indicates healthy, almost pristine water conditions; just what brook and rainbow trout need to thrive. Others are very tolerant of environmental stressors and their presence in large numbers, especially in the absence of the sensitive BMIs, suggests compromised water quality and poor conditions for sustaining fish. And of course there are a range of conditions between these two extremes.

BMIs are usually described using all of these dimensions. To illustrate, riffle beetles: can be present in both slow- and fast-moving waters, are primarily clingers preferring pebbly and stony areas, and are usually scrapers or collector-gatherers somewhat sensitive to stress. Materials and guides with such descriptions, detailed life history, biological information, and color drawings, are essential tools to those wishing to identify BMIs. *Freshwater Invertebrates* by Voshell is one of the most popularly used references.

BMI Sampling & Education

Unlike fish, BMIs cannot move great distances to avoid water pollutants, stormwater runoff, or naturally occurring stressors to their environment. They are a relatively stable community of organisms, often long-lived, that therefore reflect the effects of sediments and pollutants over time, thus adding critical information to enlarge the picture of stream conditions gained from the snapshots provided by chemical water analysis and fish monitoring.

Using a seine net, BMIs are collected from the area to be sampled. Keeping them wet, they are placed on a light-colored flat surface and carefully sorted by type into white trays (ice cube trays) filled with stream water. A variety of indices based on the total number of species, relative percentages of sensitive and tolerant species, and the most dominant species are calculated. Observations about the habitat and conditions seen at the site are recorded.

"DGIF conducts BMI surveys when investigating particular issues," states Bugas, adding, "Ongoing monitoring of Virginia's more than 400 streams requires strong partnership efforts. The Department relies on the ongoing monitoring efforts and databases of the Virginia Department of Environmental Quality (tasked with implementing the federal Clean Water Act in the commonwealth) and Virginia Save Our Streams (VASOS)."

Bugas particularly extols the BMI sampling protocol and training opportunities developed by VASOS for citizen science, and the organization of "friends" groups—such as Friends of the North Fork of the Shenandoah River and Friends of the Middle River (Bugas himself is a member of this group)—which help to implement BMI sampling and educate the public about clean water. Virginia Master Naturalists study BMI identification and sampling methods as part of their training and also work closely with river groups. Trout Unlimited chapters actively participate in monitoring the streams where they fish and put in significant preservation work.

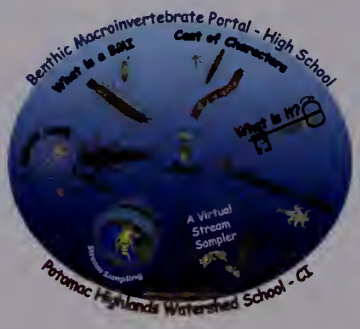
BMI sampling is a wonderful way to give our youth a hands-on, stewardship experience and teach them the value of preserving our watersheds. Cacapon Institute (CI), a West Virginia organization which works cooperatively with DGIF in a variety of forums regarding mutual efforts to preserve the Chesapeake Bay, believes that science and education are essential in the protection of our rivers and watersheds. To that end, CI has developed a truly unique Watershed e-School and innovative materials used by numerous schools throughout Virginia as part of the "meaningful watershed experience" required for all 6th and 9th grade students. Go online yourself or with your children, click on the school door of the "Potomac Highlands Watershed School," then the "BMI Portal,"—free resources to all, and a terrific way to learn more about BMI identification and sampling as well as watershed conservation. In particular, try the "Virtual Stream Sampler" activity that simulates a BMI stream sampling trip (based on real stream data) and includes stream scoring using the VASOS method.

Be forewarned, studying and monitoring BMIs is fun and exciting and you could easily become hooked on trying to identify these spineless treasures!

Virginia Master Naturalist Marie Majarov (www.majarov.com) lives in Winchester with husband Milan. Both nature enthusiasts are active in the Virginia and the Mason-Dixon outdoor writers assoc.

For More Information on Benthic Macro-Invertebrates:

- Cacapon Institute's Watershed e-school: www.cacaponinstitute.org/e_classroom.htm
- Friends of the Middle River: www.friendsofthemiddleriver.org/stream-monitoring
- Friends of the North Fork of the Shenandoah River: www.fnfsr.org/whatwedo/benthicmonitoring.html
- *A Guide to Common Freshwater Invertebrates of North America*, by J. Reese Voshell, Jr. Published by The MacDonald & Woodward Publishing Co., 2002.
- Virginia Master Naturalists: www.virginiamasternaturalist.org
- Virginia Save our Streams: www.vasos.org
- Winchester Trout Unlimited: www.winchestertu.org



This online BMI learning portal is a project of the Cacapon Institute (link above).



Fish My

by Glenda C. Booth

When studying widespread fish kills and fish disease in several Virginia rivers between 2005 and 2008, scientists found suspicious lesions on a number of fish species. Upon closer inspection, they also discovered mysterious abnormalities to reproductive organs in some.

Dr. Vicki Blazer, a U.S. Geological Survey (USGS) fish pathologist, has found two forms of feminization in fish: the presence of vitellogenin, a precursor of egg yolk, in male fish blood; and what scientists call intersex, precursors of egg cells—that female fish normally produce—in the testes of male fish, mostly bass and sunfish. In 2006, for example, in three Potomac tributaries scientists found that more than 80 percent of all male smallmouth bass were growing eggs.

Generally, intersex refers to an organism having the characteristics of both sexes, when the organism should be one, distinct sex. The fish look normal to the naked eye and to the amateur, but the fish is abnormal, with a disturbance of the hormonal system called endocrine disruption. Scientists are seeing fish with endocrine disruption all over the country.

These findings have sparked studies targeting what are called endocrine disrupting compounds (EDCs), chemicals that interfere with the endocrine function of fish. "Endocrine disruptors are widespread in the environment," says Blazer.

In addition to uncovering the intersex phenomenon, USGS scientists have determined that a high incidence of intersex occurs at sites in the Potomac watershed where farming is most intense and where human population density is the highest. And they've concluded that the greatest prevalence of intersex occurs in the spring, just before and during the spawning season.

In Virginia, scientists have found intersex fish in the upper James, Shenandoah, Cowpasture, Jackson, and Rappahannock rivers, as well as the South Branch of the Potomac River (West Virginia). In terms of species, Blazer has seen intersex in small- and largemouth bass and occasionally in redbreast sunfish. Scientists have not analyzed fish in many Virginia rivers; therefore, the full extent or occurrence of the intersex condition is unknown.



©Lynda Richardson

Are there "hotspots"? Blazer says she's seen a high prevalence and high severity in the Shenandoah River's North and South forks. "On the Shenandoah, rates of intersex were highest—ranging from 80 to 100 percent intersex in male smallmouth bass," she reports. The sample size from some of these rivers was small, at fewer than 50 fish.

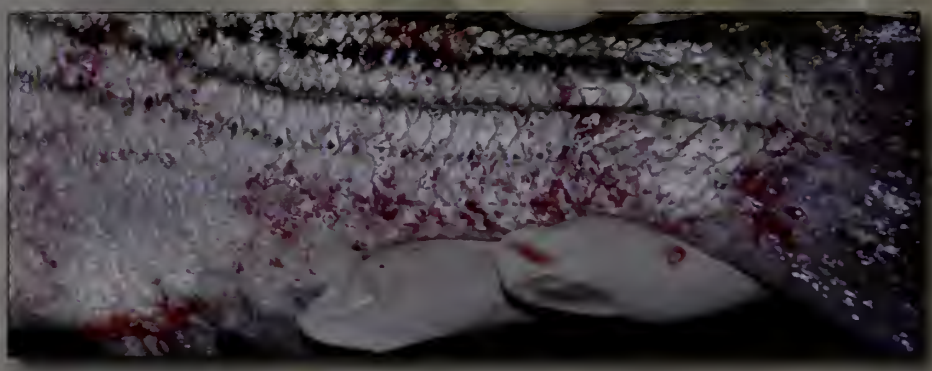
Intersex fish have also been documented in wild fish populations in the St. Lawrence, Columbia, Rio Grande, and Mississippi rivers, in Colorado waterways, and in certain areas of the Great Lakes.

Suspicious Lesions

Also troubling are fish with lesions, according to Steve Reeser, a fisheries biologist with the DGIF who has found fish attacked by bacteria with lesions on the gills and skin. Some researchers theorize that EDCs are compromising fish immune systems, making the fish more vulnerable to pathogens. However, other scientists suspect that primary pathogens could be the direct cause of the lesions and mortality.

Working with USGS bacteriologist Dr. Rocco Cipriano as early as 2007 in the upper James and Shenandoah river systems, DGIF biologists documented one particular species of bacteria *(Aeromonas salmonicida)* causing the lesions in both rivers. This species of bacteria is "fairly ubiquitous" in colder waters, Reeser reports.

"The location of disease and mortality were not consistent from year to year, but they were always a spring event when water was in a particular temperature range. The virulence of bacteria appears to be tied to water temperature, and rivers with groundwater influence are more affected. The bacteria cannot survive above about 80 degrees Fahrenheit. The reason DGIF has been focusing on a primary bacterial pathogen as the direct cause of the lesions and mortality is that the bacteria has only been encountered where and when fish disease has been observed. The bacteria has not been cultured from fish in areas where we have never seen sick fish, nor from the affected rivers when the fish appear healthy. Overall, there is not enough conclusive evidence to link the intersex condition observed in these fish to the disease and mortality events that have occurred in Virginia's rivers," Reeser contends.



Scientists across Virginia are studying fish lesions in an effort to determine causes. The striped bass shown here is from sampling performed in the lower Chesapeake Bay watershed, courtesy of the Multispecies Research Group at VIMS.

Why Is This Happening?

The endocrine system secretes hormones that govern many functions, including sexual and reproductive development in all vertebrate species, including fish and humans. Endocrine systems regulate biological processes through hormones such as estrogen, androgen, and thyroid. Chemical compounds appear to block, mimic, or disrupt the normal functions of the endocrine system of some aquatic species.

"Environmental contaminants may disrupt endocrine function," according to a USGS report. "In terms of causes, there is no specific chemical, but complex mixtures from multiple sources that can have effects. They can affect the endocrine and immune systems and make fish more susceptible to opportunistic pathogens," explains Blazer.

Compounds are everywhere, from shampoo to food containers, from suntan lotion to clothing. Over 1,000 new compounds are introduced every year, reports the Potomac Conservancy. "Our waterways are becoming a soup of hormones, antibiotics, painkillers, and other drugs," states Katherine Baer, senior director of the Clean Water Program at American Rivers.

"While we still have more questions than answers, the good news is that the severity of the fish disease and mortality have declined the past two years in both rivers and the fish populations are viable," sums up Reeser.

EDCs enter the environment through several pathways. The average American fills 12 prescriptions a year, reports the Kaiser Family Foundation. Drugs can leave the human body almost intact or unchanged, according to Baer. Pharmaceuticals are especially troubling because they are designed to alter biological processes, the effects of chronic exposures are poorly understood, and drug consumption grows each year.

Other possible sources of chemicals:

- Substances from cosmetics and body lotions are rinsed off and flushed into wastewater systems.
- Veterinary pharmaceuticals and hormones from livestock operations drain off agricultural land.
- Some natural hormones and antibiotics used in animal feeding operations pass through animals and enter the environment through animal waste.
- Compounds like estrogen from birth control pills and hormone replacements flow through sewer systems into water bodies.
- Pesticides, herbicides, and fertilizers can leach into streams.
- EDCs like polychlorinated biphenyls (PCBs), dioxins, bisphenol-A (BPA) and phthalates get into rivers and streams from industrial operations.

Reeser puts it like this: "Chemical contaminants are the 500-pound gorilla in the room, because our rivers are a soup of chemicals." He cautions, however, that natural things can affect fish immune systems too, especially in the spring. Fish come out of the winter with a suppressed immune system, he explains. Spawning is a natural stressor that taxes the immune system, compounding both natural and unnatural pressures.

Searching for Answers

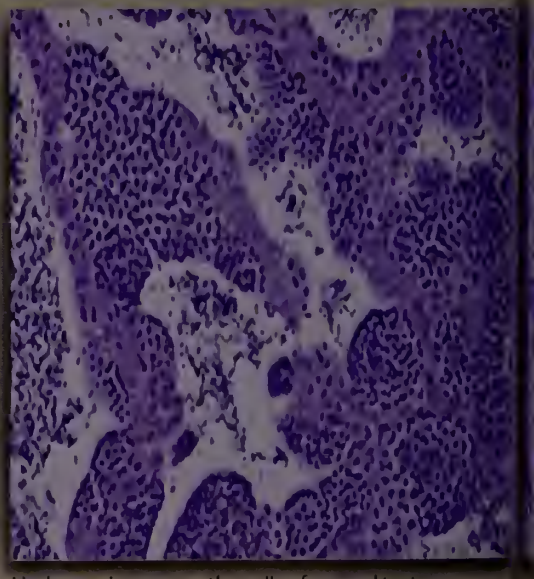
Scientists are quick to say that they need more answers. They need better data on intersex fish, lesions, seasonal variations, fish kills, and fish reproduction at a population level. The USGS and DGIF are currently collecting long-term trend information from monitoring sites in the upper James and Shenandoah rivers.

Scientists want to better understand the prevalence of certain chemicals and the effects of land uses, wastewater effluent, pesticides, herbicides, and hormones in manure. They want to learn if some chemicals by themselves are harmful and what happens when chemicals interact with other chemicals. Researchers need to ascertain what concentrations or exposures have harmful effects.

Blazer suggests keeping animals like cows out of rivers, using fragrance- and dye-free products, minimizing the use of herbicides and pesticides, and avoiding anti-microbial soaps containing triclocarban.

". . . We still don't know why certain species seem more prone to this condition or exactly what is causing it. In fact, the causes for intersex may vary by location, and we suspect it will be unlikely that a single human activity or kind of contaminant will explain intersex in all species or regions," USGS biologist Jo Ellen Hinck has said.

"Trying to determine if EDCs are a contributing factor in fish health issues in mid-Atlantic rivers is extremely difficult and profoundly complex. There are probably hundreds of thousands of chemical compounds found in these rivers and it is not known at what levels (even extremely low concentrations) they



Under a microscope, the cells of normal testes look like this. (Slide images, courtesy of Vicki S. Blazer, U.S. Geological Survey.)

can negatively affect aquatic organisms," Reeser explains.

A March 14 report in the journal of the Endocrine Society examining hundreds of studies of hormone-altering chemicals over three years concluded that health effects "are remarkably common" when people or animals are exposed to low doses of EDCs." Linda Birnbaum, director of the National Institute of Environmental Health Sciences, responded to the study by supporting testing EDCs in "ultra-low doses relevant to real human exposures." Some industry officials argued that low dose effects have not been established.

"While we still have more questions than answers, the good news is that the severity of the fish disease and mortality have declined the past two years in both rivers and the fish populations are viable," sums up Reeser.

What Can We Do?

Wastewater treatment processes are not designed to treat or remove these contaminants. Virginia does not issue health advisories for EDCs. Virginia's Department of Environmental Quality (DEQ) will investigate a site "if we identify a particular situation to try to find a cause of any demonstrated water quality problem," says Fred Cunningham, DEQ Water Permit Manager. "It's really a national issue," he adds. "There's a big concern on the drinking water side."

The U.S. Environmental Protection Agency (EPA) is conducting research to determine the extent of impact of EDCs on humans, wildlife, and the environment—EPA's Elaine Francis reported during a June 2011 conference at George Mason University—in hopes of developing risk assessments and management options. Federal water laws do not regulate many substances that affect aquatic and human health.

Some advocates argue for water quality standards to address EDCs and upgrading wastewater treatment systems. The Potomac Conservancy is pushing for "measurable, actionable solutions," says its president, Hedrick Belin.

Blazer suggests keeping animals like cows out of rivers, using fragrance- and dye-free products, minimizing the use of herbicides and pesticides, and avoiding anti-microbial soaps containing triclocarban. The Campaign for Safe Cosmetics is working to eliminate dangerous chemicals from cosmetics and personal care products, from deodorants to aftershaves. "Trash and everything else you throw in the river affects the fish," notes Blazer.

Keeping drugs out of waterways is critical, say American Rivers advocates. Their data show that 54 percent of Americans throw unused drugs in the trash, where they can leach into groundwater supplies from landfills, and around 35 percent of Americans and many medical facilities flush unused drugs down the toilet and into local waterways. Some localities like Fairfax County actively discourage flushing drugs down the toilet.

Keeping drugs out of waterways is critical, say American Rivers advocates.

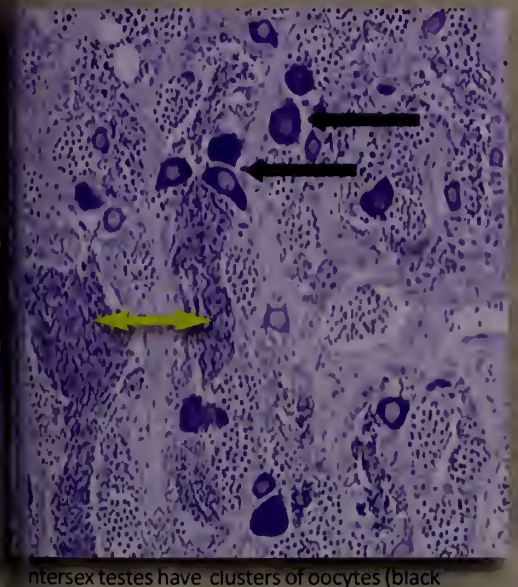
The U.S. Drug Enforcement Administration holds drug take-back days to safely discard medications. The 2011 event collected over 377,086 pounds (188.5 tons!) of unwanted medications at 5,327 sites across all 50 states. In one day, Fairfax County police collected over 280 pounds at three police stations. Check DEA's website for the next one.

And, for the Angler

What does this all mean for Virginia's anglers? Blazer's answer: "From our chemical analyses, when we look at different fish tissues, the lowest levels for many of the new chemicals are in fish muscle, which is what people eat. A lot of the new chemicals are not accumulating in the muscle. So eating fish is not necessarily an issue for humans. Humans will get exposed in many other ways."

In recent years, DGIF has not seen a decline in fish populations that the agency can attribute to fish disease. Factors other than poor water quality, such as nesting fish that are exposed to strong flows, can also affect their numbers. "We've had good spawning success the last five to six years," says Reeser. That bodes well for strong year classes of fish and that, of course, determines how good fishing will be in the years to come.

Glenda C Booth, a freelance writer and member of VOWA, grew up in Southwest Virginia and has lived in Northern Virginia over 30 years, where she is active in conservation efforts.



ntersex testes have clusters of oocytes (black arrows) within the testes, which also have sperm yellow arrow).

RESOURCES

- Fact Sheet, "Intersex Fish, Endocrine Disruption in Smallmouth Bass," http://www.fws.gov/chesapeakebay/pdf/endocrine.pdf
- Disposal of Home Pharmaceuticals, Virginia Department of Environmental Quality, http://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/VADrugDisposalFlyer.pdf
- Fact Sheet, "Don't Flush Your Medications," Fairfax County http://www.fairfaxcounty.gov/hd/dontflush/
- National Drug Take-Back Initiative, U.S. Drug Enforcement Administration, http://www.deadiversion.usdoj.gov/drug_disposal/takeback/
- Fact Sheet, Pharmaceuticals and Personal Care Products, U.S. Environmental Protection Agency, http://www.epa.gov/ppcp/faq.html#define
- Campaign for Safe Cosmetics, Environmental Working Group, http://safecosmetics.org/
- The Potomac Conservancy, 2009 State of the Nation's River report, www.potomac.org/site/wp-content/uploads/pdfs/pc_sonr_lr1.pdf.

Paradise Creek Nature Park

When Public/Private Partnerships Go Wild, Everyone Wins



An aerial view of Paradise Creek Park reveals its close relationship to the surrounding community.

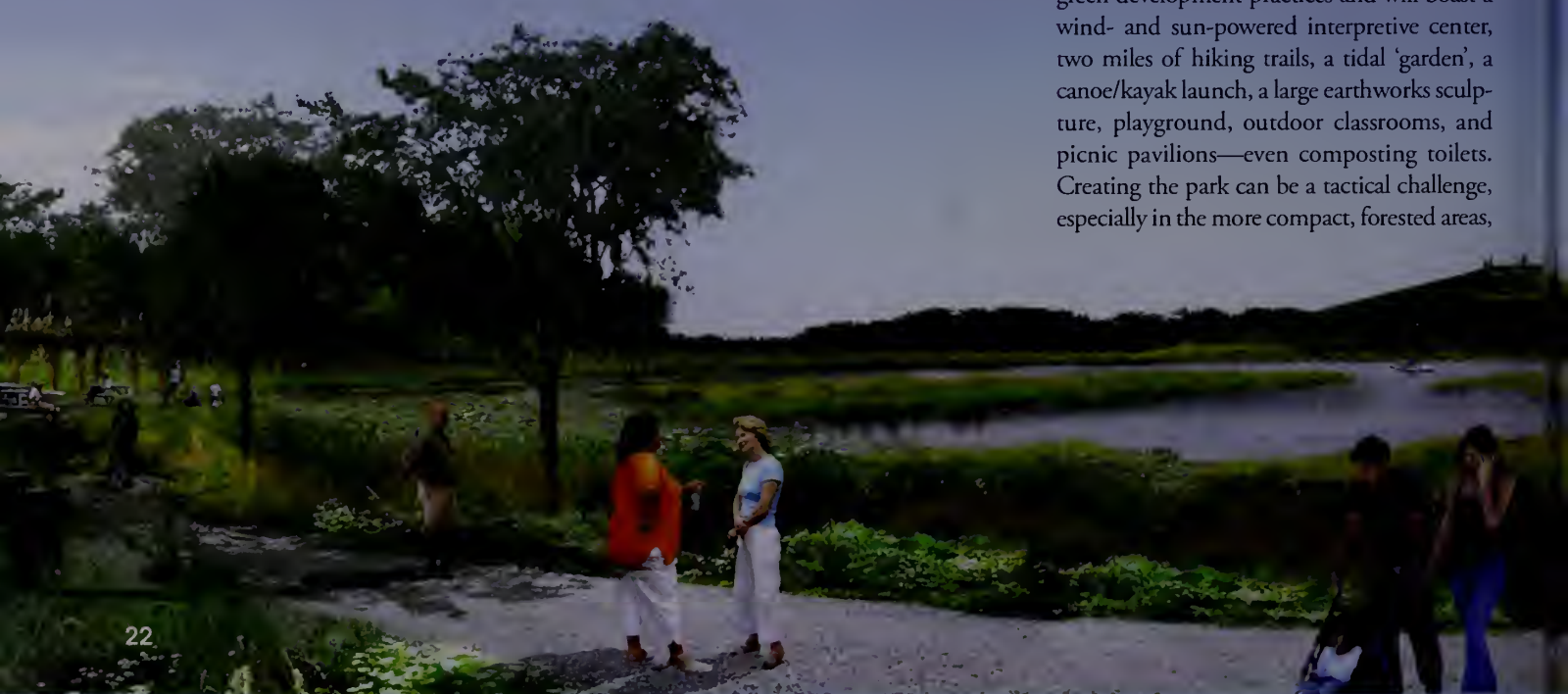
"Parks support public health, the economy, the environment, education, and community cohesion...parks produce measurable environmental and community savings. Citizens devoted to creating and revitalizing neighborhood parks help create safe communities."

–The City Park Alliance

by Beth Hester
images courtesy of the Elizabeth River Project

They're calling it Portsmouth's "big dig." To date, 350,000 cubic yards of river silt, clay, and industrial dredge spoil have been excavated from an area formerly known as the mud flats to help create a 40-acre urban nature park and wildlife nursery in the heart of Portsmouth's heavily industrialized Elizabeth River corridor. The park initiative was heralded in the recent *Growing America's Outdoor Heritage and Economy* White House conference on community-driven conservation efforts.

Once completed, Paradise Creek Nature Park will be the third largest park in Portsmouth—and the *only* park specifically designed to promote appreciation of the natural world, be a haven for wildlife and a nursery for fish, and give the community access to one of the region's most successful restoration initiatives. The park conserves 40 acres on the southern branch of the river and will include 11 acres of restored wetlands, plus mature forest. The park has been designed to incorporate green development practices and will boast a wind- and sun-powered interpretive center, two miles of hiking trails, a tidal 'garden', a canoe/kayak launch, a large earthworks sculpture, playground, outdoor classrooms, and picnic pavilions—even composting toilets. Creating the park can be a tactical challenge, especially in the more compact, forested areas,





Over 70 community volunteers cleaned up debris uncovered after phragmites was removed along a section of park land.



Area students explore the park's 'living laboratory'.

but agile construction and landscaping teams are constantly devising low-impact construction methods.

A pedestrian bridge will link adjacent neighborhoods to the park. Community support for the park has been overwhelming, and they're already calling it "a place of peace" within the bustling, historic seaport town.

The nature park is what Elizabeth River Project (EPR) founder and Executive Director Marjorie Mayfield Jackson has called the crown jewel of an innovative 250-acre environmental program led by the non-profit organization. It's part of a sub-watershed restoration plan, one that is becoming a model for restoring the greater Elizabeth River and the Chesapeake Bay "one creek at a time." Joe Reiger directs watershed restoration for the ERP and explains how the Paradise Creek Nature Park embodies this strategy:

"Almost twenty years ago when we initially began to look at ways to clean up contaminated areas around the watershed, we had rather scattered tactics. We worked on a number of projects around the river, but what happened was that in a 200-square-mile watershed, doing a project here and a project there, well, you don't completely realize the impact of your work. We knew that we needed more than a shotgun approach, so we started to look at river remediation and restoration on the sub-watershed level, and after several years we developed a plan to concentrate a great deal of our work on sub-watersheds along the river where everyone can see, and feel, the collective benefit of these efforts."

The Paradise Creek area is a perfect example of this approach, as it's a microcosm of the entire watershed; it is partially residential, partially commercial, and heavily industrialized. Four superfund sites along the creek—largely legacies of wartime shipyard activity—have been remediated by the U.S. Navy and transformed into wildlife-friendly, warm-season grass meadows.

Since its inception, the ERP has forged a unique partnership of public/private concerns for the benefit of the region. The Paradise Creek Nature Park project showcases the





The artist renditions here and on pp. 22–23 help park visitors envision all the amenities to be offered upon project completion.



A local Young Life group enthusiastically pitches in to trim invasive vines.

powerful impact of ongoing conservation and restoration partnerships that range from the National Fish & Wildlife Foundation, the U.S. Navy, the Virginia Port Authority, the University of Virginia School of Architecture, Enviva LP., Giant Cement, SPSA, CSX Transportation, the U.S. Army Corps of Engineers, and the Virginia Department of Environmental Quality, to various foundations, garden clubs, and civic leagues. Park construction may be in its first phase, but already the beneficial effects are reverberating throughout the community.

The public entrance to the park was once a garbage and phragmites-filled border flanking a busy roadway and concealing an impromptu transient encampment. Now, people driving past this strip of land will enjoy a changing seasonal palette of native plants and vegetation. The adjoining parking area is constructed of pervious gravel paving to reduce stormwater runoff, and the medians will perform double-duty as rain gardens.

Varieties of wildlife species are currently reclaiming this revitalized area as their own, and a recent survey undertaken by an Old Dominion University ornithology team discovered 14 species of birds. Box turtles have been spotted, and there are fox, osprey, garter snakes, and a great horned owl. A nearby oyster reef at the mouth of the creek was created by community volunteers, and 16 species of healthy fish have been recorded using these new piscatorial amenities. An exciting part of the wetland creation is the formation of an open channel that will link the wetlands directly to Paradise Creek, thus creating a viable nursery for fish, crabs, and local aquatic life.

The nature park also will serve as a teacher training base and living laboratory for students. The Portsmouth Public School System is already creating a "wetlands in the classroom" curriculum that will support SOL mandates. The programs of study will include an osprey initiative, pre-school wildflower program, and oyster reef experience.

Volunteers, including participants from the Boy Scouts and Young Life Association, have logged many hours cutting back invasive vines, growing wildflowers for park plantings, and acting as de facto park ambassadors, cultivating beneficial long-term support for the park's initiatives among area youth. During an official groundbreaking ceremony, Young Life/I.C. Norcom High School representative Ulysses Keeling thanked the ERP and other project sponsors for involving them in the project, calling their experience "a beautiful thing."

Paradise Creek Nature Park will be a living legacy for generations to come. From a macro-perspective, it anchors an ever-growing, thriving network of clean river initiatives within the Chesapeake Bay watershed. Closer to home, the park and complementary ERP conservation and reclamation projects further the collective goal of making the Elizabeth River swimmable and fishable once again.

Beth Hester is a writer and freelance photographer from Portsmouth. Her passions include reading, shooting, kayaking, fishing, tying saltwater flies, and tending her herb garden.

FOR MORE INFORMATION

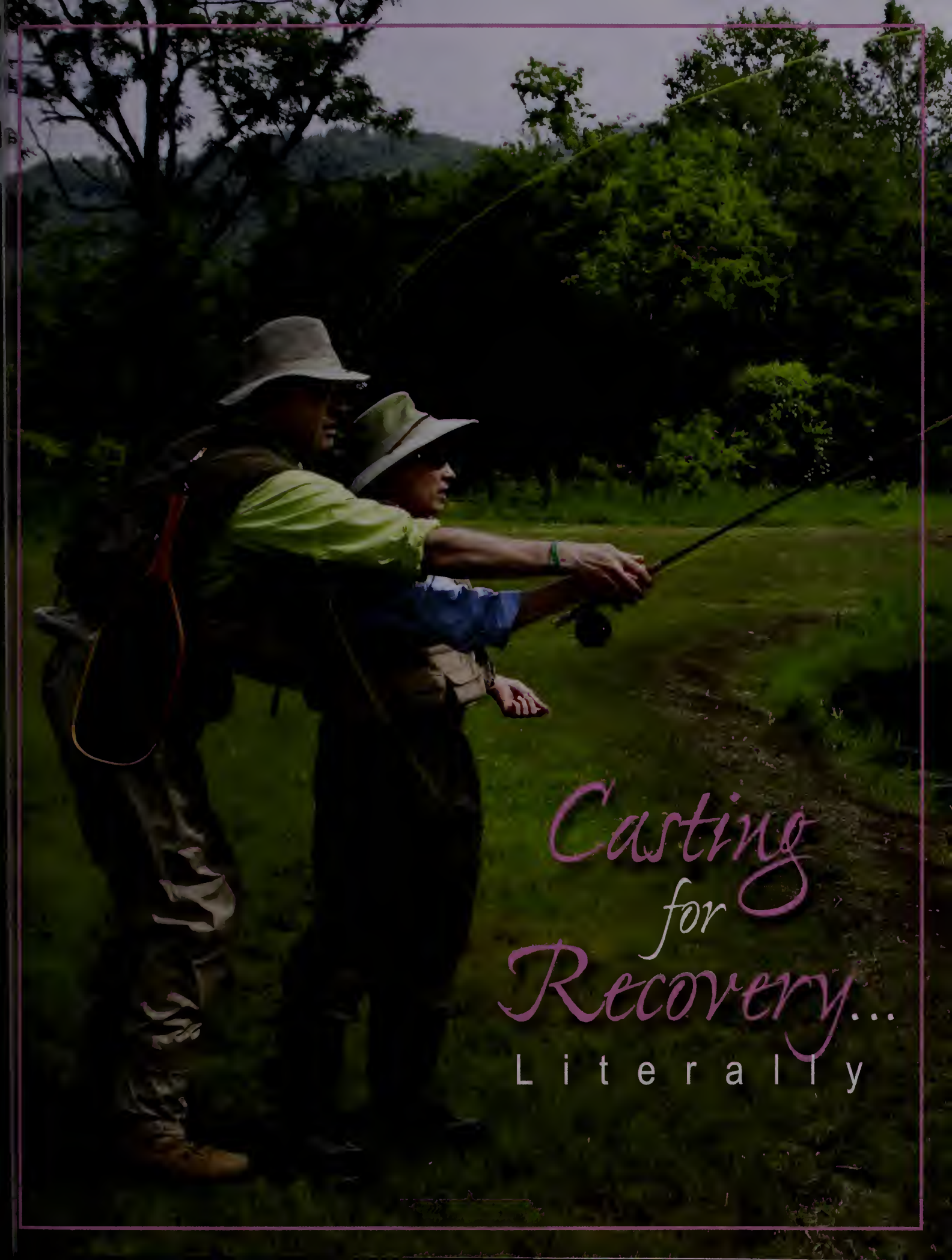
For more information on Paradise Creek and other Elizabeth River Project initiatives, visit:

- www.ElizabethRiver.org



Volunteers place seed oysters at the mouth of the creek. Craddock neighborhood residents and Boy Scout Troop 222 will grow oysters in floats for summer planting.

© Bruce Ingram


Casting
for
Recovery...
Literally



©Bruce Ingram

by Bruce Ingram

Over my 33 years of marriage, the worst thing I recall is that day in September 2008, when Elaine was diagnosed with breast cancer. One of the best things in her revitalization, after seven months of chemotherapy and a double mastectomy, has been her participation in a Casting for Recovery (CFR) retreat in May of 2010.

Launching in 1996 with four retreats and now offering 46 retreats in 33 states including Virginia, CFR is a national, nonprofit organization that supports breast cancer survivors through activities that combine fly fishing, counseling, and medical information to create an emphasis on wellness instead of illness. Why fly fishing, though?

Lori Simon, executive director for CFR, believes that just being out in nature provides healing qualities, both mentally and physically, and teaching participants how to fly fish helps connect them to the outdoor world.

"The motions of casting a fly also gently stimulate and heal the muscles affected by radiation or surgery," added Simon.

A breast cancer survivor herself, Carolyn Harvey is program coordinator and retreat leader for the Virginia events. She plans a budget and performs fundraising, community outreach, participant recruitment, and volunteer recruitment and training. Her introduction to CFR came in 2003 as a participant.

"The staff treated us as royalty and made the experience something to last for a lifetime," she recalled. "I came to a group of women as a stranger and left having made friends that left an impression on my life that I would not forget and that also gave me an opportunity to develop a love of fly fishing. I've volunteered with other organizations around breast cancer, and the warmth and fellowship developed between the CFR retreat staff and participants made me want to give back."

Mollie Simpkins is volunteer media coordinator for the Virginia retreats.

"I do this because breast cancer awareness and serving the women who have been affected is my passion," she said. "When my mom was diagnosed in 1983, breast cancer was not talked about in polite company. Even eight years later when she lost her life, it was not something that many were comfortable having a conversation about ... Times have certainly changed for the better.

"I'm just lucky enough that my position gives me the knowledge base to reach out to the media. Working with the amazing people of CFR, both nationally and locally, along with the participants and all of the volunteers, has absolutely changed my life and focused my purpose."

A Typical Schedule

Elaine and I attended the May 2011 retreat in Madison County as members of the media. Over the course of two and a half days, fly-fishing activities (knot instruction, fly tying, practice casting, entomology, equipment needed, stream etiquette, and finally, actual fly fishing) are combined with discussions on the physical and emotional aspects of dealing with breast cancer and the objective of overall wellness. Volunteer anglers handle the guiding aspects, and volunteers in the medical field handle the physical and emotional dimension.

Media members are only allowed to attend the last day of the retreat. When Elaine and I arrived, participants were eating breakfast and taking part in drawings for fly-fishing gear. Soon afterward, the ladies paired off with the volunteer men and women who were to be their guides for the morning fishing at a farm pond. While all of this was going on, Elaine saw her guide from the 2010 Virginia retreat, Andy Manley of Fairfax.

"Do you remember how I told you to retrieve a fly," Andy asked when he greeted my wife.

"Strip, strip, strip," giggled Elaine, and then both laughed about a man instructing a woman to do so in front of her husband. That type of light-hearted banter is very much a part of CFR retreats, but they contain a powerful emotional component as well.

"I've had three different bouts with breast cancer and still have 'chemo brain,'" said Karen Hines of Virginia Beach. "Last night, I got my best night's sleep since this whole cancer thing started.

"Meeting and talking with other women who have been through what I have been through and who were so supportive of me is the best thing that has happened to me in a long time. I wasn't much of a fisherman before coming here, but being outside and enjoying nature is very healing."

Manley agrees about the emotional aspects, for both the guides and the participants.



Left, volunteer Marcia Woolman of Middleburg lands a fine trout for participant Rachel Wetherill. Above, Sara Fought shrieks with joy after landing her first trout with the help of guide Brian Randolph. ©Bruce Ingram

"One of the most special memories I have took place at my first retreat," he recalled. "My participant was close to 70, had never fished, and was a little unsure of herself when we waded out into a trout stream.

"But then she started catching trout like crazy and became so excited that she almost lost her balance and fell in. Just to see her enjoying the outdoors is something that I'll never forget."

It was time for these 13 attendees and their guides to go fishing at a farm pond stocked with trout and bluegills. I first observed Manley tutoring Hines.

"I caught my first fish on a fly rod yesterday," Hines told me. "It was a beautiful 4-inch bluegill. I'm going to catch my first trout today."

Soon afterwards, Hines hooked a jumbo rainbow that immediately leapt into the air, threw the fly, and landed with a loud splat.

"Are the other fish going to go away now because of all that racket?" Karen asked Andy.

Soon afterward, across the pond I witnessed Rachel Wetherill of Bluemont doing battle with a huge rainbow as guide Marcia Woolman of Middleburg coached her on how to fight and net a fish. After numerous leaps and runs, the trout finally entered Woolman's net and Rachel beamed with delight.

"Last night, the women formed a circle and shared their darkest fears," Wetherill told me after releasing the fish, her first-ever trout. "I can't tell you how much love and support I felt when that was going on.

"Fishing is a way we women can get close to one another, too. It's something that we can experience with our new friends for the rest of our lives."

I then heard shrieks of joy coming from farther down the shoreline and went to investigate. The sounds were coming from Sara Fought, who was simultaneously talking, laughing, and well, yes, shrieking at her just-landed trout, along with guide Brian Randolph of Reston, and me.

"I'd never been fishing before," she exclaimed. "I thought at best I might catch a little sunfish. But the whole retreat has been about me doing things that I didn't think were possible, from being able to survive breast cancer to catching a big trout."

◆◆◆

On a personal note, Casting for Recovery has played a major role in Elaine's healing. She has developed friends from her participation in the 2010 event. Before CFR, she regarded going fishing with me as merely an unpleasant, wifely chore to be endured every few years. Now, we plan trips together and Elaine regularly orders gear from catalogs. My wife even ties her own flies, adding to her kit turkey feathers and deer hair from game I have harvested.

CFR welcomes donations and volunteers from corporations, clubs, and individuals, as participants do not have to pay to attend a retreat. The Virginia retreat raised funds for 13 women to attend last May, but with additional donations more could participate. Individuals are turned away every year because of a lack of funding. As the omnipresent CFR motto states ... "To fish is to hope."

Bruce Ingram is the author of four books on river fishing and writes a weekly outdoors blog; for more information: www.bruceingramoutdoors.com.

FOR MORE INFORMATION ON HOW YOU CAN HELP

Casting for Recovery:
www.castingforrecovery.org
(888) 553-3500
www.facebook.com/cfrmidatlantic



Outdoor Classics

by Beth Hester

The Everything Guide to Foraging: Identifying, Harvesting, and Cooking Nature's Wild Fruits and Vegetables

by Vickie Shufer

2011 F+W/Adams Media
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"Knowledge that isn't used is lost. It's one thing to know how to identify a particular plant and know it's edible, but you also need to know how to process and prepare it."

–Vickie Shufer

This new book by one of Virginia's foremost experts on native plants and wild foods fills a real void in wildcrafting literature. It bridges the gap between the traditional pictorial plant identification field guide and wild food books that contain recipes, but which seem targeted to a niche audience of wild food devotees. Here is a book for the rest of us, suitable for both novice foragers and experienced wild-foodies alike. Packed with information on sustainable, earth-friendly foraging tactics, conservation ethics, and recipes that emphasize each season's bounty, Shufer also includes safety guidelines crucial to successful foraging, touching upon topics such as allergies, poisonous plants, and pesticide use.

Readers can put together numerous delicious, multi-course meals from the recipe chapters: everything from soup and appetizers to dessert, preserves, vinegars, and cordials. There are recipes for Clover Mint Tea, Rose Hip Cider, Jerusalem Artichoke Salad, Red Bud Stir-fry, Wild Veggie Pizza, Stuffed Wild Grape Leaves, and Beech Nut Pie.

But there are limits to foraging enjoyment if you don't know how to prepare, store, and preserve nature's bounty, or if you don't know which kitchen devices can make wild food preparation easy and fun. Shufer thoughtfully suggests methods by which anyone can safely dry, can, freeze, or dehydrate a variety of wild foods, and adds a compendium of useful kitchen gadgets and utensils. In addition, there is a chapter designed to assist readers who might be interested in growing and reproducing native wild plants on their own. An extremely useful volume.

King George County's Outdoors Club

by Ken Perrotte

Youngsters who signed up for King George County Middle School's new "Outdoors Club" are enjoying a full sensory experience during the program's initial year. They have heard and practiced with deer, duck, and turkey calls, learned about the workings of trail cameras, studied deer and their habitat, and even tried butchering venison quarters into pan-sized pieces of meat.

The club had informal beginnings last year when English teacher Mark Fike hosted lunchtime discussions with several students who expressed interest in hunting and fishing. Brown bag lunches of wild game prepared by Fike or the students' parents were occasional treats.

After the Department's Senior Conservation Police Officer Frank Spuchesi spoke to the group one morning about treestand safety, he and Fike hatched a plan for an outdoors club. After all, there were drama clubs, chess clubs, and more. Why not an outdoors club?

Fike laid the groundwork with the school and when first-year teachers Kevin Linza (social studies) and Sarah Smigielski (math) heard about the plan, they wanted in.

The fledgling club initially had 60 students sign up, making it the school's largest! The teachers surveyed the children to assess their level of experience and identify the topics they wanted to see covered. The kids suggested nearly 30, including cooking venison and game, aging deer by their jawbone, reading a river, using a fish finder, and more.

Students often break into groups, based on individual interests, for their monthly meetings. Some may hear a presentation about waterfowl hunting, while others take to the woods to learn how to read animal sign or use a piece of outdoors equipment. Linza says the club reinforces outdoors ethics and opportunities for the experienced youngsters and introduces newcomers to things that may later become passions.



Teacher Kevin Linza (L) gives students a turkey calling demonstration.

"Some of these children don't have role models to expose them to the outdoors. Maybe the parents aren't interested, but the kids are … This gives us a chance to share what we know and love," Linza said. "It's a positive, educational environment."

Virginia Herpetological Society Events

June 23–24: *Annual "HerpBlitz" Survey*, Mattaponi Wildlife Management Area

August 18: *1-Day Survey Event*, Caledon Natural Area State Park

More information at:
www.virginiaherpetologicalsociety.com/2012-events/2012-vhs-events/index.htm

Attention Anglers

The 2011 Angler Hall of Fame will now be published in the July/August issue of the magazine.

Black Bear Management

Bear populations have increased in Virginia and throughout the eastern U.S. during the past quarter-century. Harvest management, reforestation, public land purchases, oak forest maturation, bear restoration efforts, and natural range expansions have all contributed to bear population growth here. Although this growing population has been welcomed by many people, the abundance of bears can also create concerns for others.



Since 2001, Virginia's Black Bear Management Plan (BBMP) has provided the blueprint for black bear management to meet the Department's mission of managing *"wildlife...to maintain optimum populations...to serve the needs of the Commonwealth."*

For six weeks during June and July, we are asking for public input on the revised BBMP. This plan has been constructed over the past two years through guidance from public Stakeholder Advisory Committees and the DGIF Technical Committee. The goals in the revised BBMP reflect the values of a diverse public and are broad statements of principles and ideals about what should be accomplished with bear management in Virginia. This plan will guide black bear management across the commonwealth over the next ten years.

We encourage you to review and comment on the draft BBMP, which will be posted at www.dgif.virginia.gov/comment.



Celebrate National Pollinator Week

June 18–24, 2012
www.pollinator.org

Pollinators are critical to the health of the planet and an abundant food supply. Many species are at risk, including the honeybee. A host of environmental factors are suspect, including pesticides and cell phone towers. But fortunately, people are waking up to the need to protect—rather than harm—these winged partners that carry so much weight.

Education is key. Did you know, for example, that a honey bee:

- Pollinates flowers, vegetables, and agricultural crops within a five-mile radius of its hive.
- Only stings as a last resort (if stepped on, for example), because doing so means instant death.
- When traveling or resting as a swarm, is completely docile. The bees are totally focused upon protecting their queen, who is being "escorted" at the center of the swarm.
- Along with other pollinators, generates one-third of our food supply.

Quail and Upland Wildlife Federation

June 16: Fundraiser benefiting wildlife habitat and youth programs of Virginia. Shady Grove Kennels, Remington, 9 A.M.–2 P.M. Open to all. Adult sporting clay and youth shotgun and rifle shooting.

For details call 703-232-3572 or e-mail jsaggers@gmail.com.



Recycle Your Fishing Line!

For Mary and Billy Apperson, their latest fishing trip to the James River produced something that they never thought they would catch. This great horned owl had a fish hook in his shoulder and had been trying in vain to get free from the entanglement. The Appersons found him exhausted, suspended between two trees.

After rescuing him, they received our permission to transport the bird back to a Williamsburg vet clinic. Sadly, the bird expired before receiving medical care.

Anglers and boaters are encouraged to properly dispose of used monofilament fishing line! Many boat landings and public access sites around the state have special PVC containers for collecting used fishing line, making it easy to do so.

For information about the program, locations of recycling containers, and how groups can become partners in sponsoring potential container sites, please go to www.HuntFishVA.com.



"Hey Mom, you won't believe it but Dad caught a boot this big."

Whitetail

Summer = Seaso

essay by Matt Knox

With the start of summer, the whitetail's world has again undergone a dramatic change: the fawns have arrived. All of the chaos of the breeding season, or rut, 200 days prior has now resulted in the arrival of the next generation of deer. In Virginia, this happens in late May and early June and translates to the arrival of probably a half-million new, spotted wildlife residents in less than one month's time.

Does which separated from their family groups to set up and defend a fawning territory have now given birth. In healthy deer populations, most adult does give birth to twin fawns. Not surprisingly, older does with higher social status and more experience tend to make better, or more successful, mothers.

Fawns are generally born head and feet first and are able to stand and nurse within about 30 minutes of birth. Twin fawns are normally born 10 to 20 minutes apart. After the fawns are born, the doe will lick them clean and groom them and eat the afterbirth to reduce odors, thus minimizing the chance that predators will find them. These first hours of seclusion are critical because they allow the doe and fawn(s) to imprint each other, forming a critical bond where the doe will be able to identify her young in the future.

Young white-tailed deer fawns are hiders. This means the doe leaves them lying in the woods and fields alone nearly all the time for the first couple of weeks to month of life. The doe does not abandon them. She moves off far enough that her presence does not draw attention to the fawns, but remains close enough that she can come to their defense if necessary. Picking up a young fawn will normally cause it to make a piercing cry or bawl, which will bring the doe running. It is often during this time of year that protective does attack dogs, or sometimes even people, defending very young, hidden fawns.

During these critical first weeks, the doe will approach the area where the fawn is hiding two to four times each day, mostly during daylight hours. With a soft grunt she will call the fawn to her, allowing it to nurse for 5–10 minutes. While it is nursing, she will lick and groom it. Then she will typically move the fawn a short distance and leave quickly. When she leaves, the fawn will automatically lie down again to resume hiding.

Healthy fawns generally weigh about six to eight pounds at birth, and they grow quickly. During a typical nursing session a fawn will consume about eight ounces of milk, which is richer than cow's milk, and will usually gain about a half-pound per day, tripling its birth weight in the first month of life.

Although ruminants by nature, a fawn has a digestive system folded in such a way early on to allow the milk to bypass the rumen and reticulum. By two to three weeks of age, fawns begin to eat vegetation. Although fawns can be seen nursing into fall, by 12 weeks of age they are functionally weaned and full-time ruminants.

The spotted coat of a hiding white-tailed deer fawn is one of the most well-known physical characteristics. White spots on a chestnut brown background act as nature's



©Bill Lea

Biology
n of the Fawns

camouflage, hiding the fawn by mimicking dappled light coming through the forest canopy. Yes, someone has counted the spots. On average, a fawn has between 270 and 350 of them, with two fairly straight lines down either side of its back and the rest scattered randomly over its sides. This camouflage works so well it is very difficult to see and find fawns in the woods.

For the first five to ten days of life, young fawns will lie completely still and not even attempt to escape when approached by a predator or a person. Because of this behavior, very young hiding fawns are highly vulnerable to predators such as black bears and coyotes. Many fawns do not survive. At least ten percent are generally lost to natural causes, and fawn predation rates of 20–30 percent, up to 75 percent or more, have been documented across the Southeast recently. Not surprisingly, most predation losses occur during the first week to ten days of life.

Many times in suburban environments, young fawns will be found hiding in homeowners' yards or mulch beds, or even on porches or in carports. Because the fawns appear to be alone, well-meaning people pick them up, thinking they have been abandoned. They have not. Young fawns should *not* be picked up in late May and early June. Truly orphaned fawns, injured fawns, or fawns mistakenly picked up as orphans should be returned immediately to the area where found. If that is not possible, they must be taken to a licensed wildlife rehabilitator. It is illegal in Virginia to keep deer as pets.

By ten days to two weeks, although they still spend most of their time bedded and hiding, young fawns have changed from helpless hiders into exceptional escape artists, easily outrunning a person and most predators. As fawns age they become more active and spend increasingly longer periods with their mother, playing and frolicking about. By one month, sibling fawns that were kept separated since birth are reunited. These play sessions are important to building strength and agility for escaping predators. Most activity by young fawns takes place during the day. This is thought to be an adaptation to avoid nocturnal predators like coyotes and bears. The first two months, most of their time is spent alone with their mother and siblings; however, by three months of age they will quit their solitary lifestyle and reunite with their mother's doe family group and other fawns. By fall, the fawns spend all of their time accompanying the doe.

While family life occupies the does during summer, adult males literally lie around and do nothing except grow antlers. Bucks remain in loose bachelor groups, with size and membership routinely changing until the rut begins in September.

Antler growth in male deer is the fastest normal tissue growth known among mammals; most is accomplished in less than 100 days during May, June, and July. Growing antlers are sensitive, tender, and soft. Bucks go out of their way to avoid injuring them, as injuries frequently result in malformed antlers.

By August 1, shortening days mean the annual life cycle of the deer is beginning to turn again, back to fall and back to deer life in the rut.

Matt Knox is a deer project coordinator for the Department, serving south-central Virginia.



©Bill Lea

PHOTO TIPS

by Lynda Richardson

There's An App For That!

One spring, I joined Bob and Linda Cole and long-time buddy Mitchell Byrd for a bird watching trip to Dutch Gap and Henricus Park. We were looking for spring warblers; more specifically, the common yellowthroat. Wandering around areas known to be yellowthroat haunts, we scanned the trees with our binoculars, listening intently for their calls. There just weren't any to be found.

"They have to be here by now," Mitchell noted aloud. We all stood quietly watching the canopy above. Then, something amazing happened. Linda pulled out her phone and called a yellowthroat.

"Witchity-witchity-witchity-witchity," the bird's fast, melodious voice erupted from her hand. Within seconds, "witchity-witchity-witchity-witchity-witchity" cascaded down from the trees.

"How did you do that," I asked, walking over to see what number she could possibly have dialed. Linda showed me her phone and on it I saw the photograph of a beautiful common yellowthroat in breeding plumage with a listing of several vocalizations below it. You simply press one and it plays the bird song of your choice.

Linda scrolled around the phone, showing me other birds and the information included with each. Her phone was a hand-held encyclopedia of bird songs, descriptions, habitat preferences, ranges, and even a place where you could report sightings and keep a log of birds you'd seen and where you'd seen them. You could also find out what birds had been sighted recently and where. I'm not kidding... there was even a map to direct you to the location.

Linda filled me in to an amazing thing called APPS and I want you to know there are a BILLION apps out there for just about anything you can think of, including photography. I wasn't really interested in apps before as I still owned an "ancient" 2003 flip phone. Now, apps had my attention.

You wouldn't believe the number of apps that can be found in the bird identification field. Some are free downloads, while others range in cost from $9.99 to $39.99 depending on the extent of the collection. The Green Mountain Digital Audubon Society Field Guides offer an entire collection including birds, mammals, trees, and wildflowers for $39.99, or just birds for $19.99. The Sibley eGuide for $19.99 or the National Geographic Society's Handheld Birds app for $9.99 are great bird-only apps. Feel free to try them out before you buy, as each will allow you to preview the information! If you have an iPhone, simply go to the App Store icon on your phone, do a search, and shop away.

Needless to say, I now have an iPhone and a bird field guide app, and I love both of them! If I'm taking a walk, birdwatching, or just hanging out, I enjoy opening the app and listening to various vocalizations—trying to memorize them and which bird creates them. I have also been checking out the photography apps, which look pretty darn cool too. And oh, did I tell you the iPhone also has a really great camera? Stay tuned for more on that! Happy Apping and Happy Shooting!

Please Note:
The use of apps or other means of playback to call in birds remains a controversial topic among birders. It is important to note that there are some situations in which the use of such playback is either illegal (when used on threatened or endangered species) or prohibited (in many parks and refuges). Recommendations on appropriate situations and ways to use this technology most effectively, while minimizing disturbance to birds and fellow birders, are available at: www.sibleyguides.com/2011/04/the-proper-use-of-playback-in-birding/.

Lynda Richardson's Photography Workshops

Be sure to check out my upcoming workshops at: www.lewisginter.org or my website at www.lyndarichardsonphotography.com!



Bob and Linda Cole and Mitchell Byrd (R) look for common yellowthroats at Dutch Gap. Linda plays an app on her phone that has the song of the bird we are after. Amazingly, one responds! Obviously, this is a great tool for photography! © 2011 Lynda Richardson

On the Water

by Tom Guess

Things That Make You Wonder

It's starting to feel like boating season and you are either already on the water or getting your boat ready for that. Our staff receives hundreds of calls and emails each year with questions about boating equipment or boating laws. I thought this might be a great opportunity to share some of the most commonly asked questions with you.

Where can I get a copy of the Virginia Watercraft Owner's Guide?

This year we merged the *Virginia Watercraft Owner's Guide* into the *Virginia Freshwater Fishing & Watercraft Owner's Guide*. This new combined guide is available at any licensed vendor that sells a license for the Department. They are also available in the sporting goods section of several major department stores, as well as rest areas, visitor's centers, and various locations that have information kiosks containing outdoor information. The guide is also available online through our website: www.HuntFishVA.com.

Do I need to register my boat, and if so, why?

This requirement is derived from the Code of Federal Regulations, 33 CFR 173: All vessels with propulsion machinery (electric, gasoline, diesel, steam, or other) must be registered in the state of principal use. States can be more stringent than the federal requirement, but must at least meet this requirement. This is why all vessels, even vessels with a trolling motor, must be registered.

Do I need a horn or whistle on my boat?

All vessel operators are required to be able to make a sufficient sound signal if needed. For vessels less than 39.4 feet, this could be as simple as a police whistle—which is audible for up to 0.5 nautical miles. Many boats are equipped with automotive-style horns, or the operator may have a Freon-style, manually activated horn on board. Any of these will make a sufficient sound signal and meet the requirements of the law. This is why we issue a whistle to every student who takes a Boat Virginia classroom boating safety course.

Why do I need a boating class? I have been boating all my life and never had any trouble.

Many boaters often launch and return at the same ramp, transit to the same area, or boat the same way with no trouble for many years; however, if they find themselves in a position of having to navigate to another area due to weather, or navigate in fog, or if they have a sudden onboard emergency, it may be a much different story. On average, recreational boaters who complete a basic boating safety course approved by the National Association of State Boating Law Administrators (NASBLA) are 75 percent less likely to be involved in an incident on the water.

Virginia experiences, on average, 120 reported accidents and 20 fatalities annually. Only about 11 percent of these accidents involve alcohol and the incidents involving rental boats are very low. Most accidents happen on small, open motorboats during calm weather in the late afternoon. By taking an approved boating safety course, you will not only be in compliance with the law, you will be mitigating the chance of being involved in an incident on the water. The Boat Virginia classroom course is *free* of charge. You can also take a course offered by the U.S. Coast Guard Auxiliary, the U.S. Power Squadrons, or online through a third party provider for about $25–35, depending on the course you choose. To locate a classroom or online course, visit our website: www.HuntFishVA.com.

Until next time: Be Responsible, Be Safe, and Have Fun!

Tom Guess, U.S. Coast Guard (Ret), serves as the state boating law administrator at the DGIF.



©Bill Lea

Dining In

by Ken and Maria Perrotte

Oven Barbecued Bear



Talk to most wild game neophytes about eating bear and watch with a smile as their defensive shields are activated.

"Bear? Isn't it too greasy?"

"Bear? Isn't it too gamey?"

"Bear? Can't it make you sick?"

Greasy and gamey are usually a function of field care. Proper handling is essential from the time the bear is killed through the processing and final preparation of the cuts of meat for the cooking pot. It is true that bears can carry the parasites that cause Trichinosis. The solution here is to simply ensure the bear is well cooked, to an internal temperature of at least 165° throughout. The truth is, once people try well-prepared bear, it often achieves delicacy status and a place at the top of the tasty red meat list.

Bears are expanding their range in Virginia. Additional seasons could mean more lucky hunters might be adding this flavorful, rich red meat to the dinner table.

Maria originally concocted this recipe using kitchen know-how and a creative gleaning of ingredients hanging out in the refrigerator. It has never failed to delight *anyone* who tried it. And, here's a secret—it would work just as well with a nice venison roast.

Ingredients

1 small bear roast, about 1.5 pounds, well trimmed of silver skin, gristle, and visible fat
1 or 2 tablespoons salt for brining
1 teaspoon bacon fat
1 teaspoon olive oil
¼ teaspoon cracked black pepper
½ onion, chopped
2 tablespoons green pepper, chopped
1 rib celery, chopped
1 clove garlic, chopped
⅛ teaspoon paprika
1 teaspoon chili powder
1 teaspoon dry mustard
1 tablespoon tomato paste
⅓ cup ketchup
¼ cup vinegar
1 tablespoon sugar (more or less to taste)
6 or 7 drops Tabasco or hot sauce
1 teaspoon lemon juice
1 tablespoon Worcestershire sauce
1 tablespoon canola oil; less if bear has any fat
½ cup water
Fresh chopped chives

Prep and Cooking

In a non-metal container, brine the meat in a mixture of 1 tablespoon salt to 3 cups water. Use more salt and water if needed so that the roast is fully covered. Brine for at least 4 hours, or overnight. Drain the meat, pat it dry, and let sit it on counter to air dry and for about 15 to 20 minutes.

Preheat the oven to 300°.

In a Dutch oven or oven-proof pan, heat the fat and olive oil over medium-high heat until it shimmers. All oil can be used if you don't want the bacon fat. Brown the meat on all sides and remove to a plate. Turn down the heat to medium-low and add the onions, celery, and green pepper. Sauté until soft. Add the garlic and dry seasonings and cook for a minute. Add the tomato paste and cook another minute. Then add the rest of the ingredients, turn up the heat, and bring to a boil. Add the meat and turn or baste to cover the meat with sauce. Cover and place in the oven. Cook for 3 or more hours, depending on the size and shape of the roast. Turn and baste occasionally. Add a little water if the sauce gets too thick or dry.

When done, the meat must be fully cooked and should be fork tender and easily shredded. Garnish with coarsely chopped fresh chives for color and flavor. Accompany with favorite potato and vegetable sides, such as lightly sautéed tomatoes. A hefty, dry red wine that's not too heavy on fruit nuances pairs well.

Sautéed Grape Tomatoes

½ tablespoon olive oil
½ tablespoon unsalted butter
1 pint grape tomatoes
Pinch of sea salt and fresh cracked pepper

Heat olive oil and butter in a frying pan over medium heat. Add tomatoes, salt, and pepper. Cook until soft, stirring several times.

Coming This July!

Change is a part of life, and that's certainly true of the publishing world these days. So you will probably not be surprised to learn that this magazine will undergo some changes soon.

Beginning this July, *Virginia Wildlife* will become a bi-monthly magazine. We will add more pages, more content, and more special features—as we move to six issues a year: July-August, September-October, November-December, January-February, March-April, and May-June. This change means that, even in the face of increased production costs, *Virginia Wildlife* will maintain its low subscription rate and remain free of advertising while giving you more of the stories and photography that you have asked for. Our goal is to make every issue bigger and better than ever!

We will kick off the new format with a special feature about the history of the Pittman-Robertson Act, the legislative linchpin in the foundation of all wildlife and sportfishing restoration programs across this country. The following issue will include a special hunting guide, running at the start of the fall seasons. Also coming to you next year will be a trout guide, a fishing forecast, and a special outdoors guide showcasing wildlife-related recreation opportunities and events. That guide will be combined with our annual photography contest, to be published in July-August 2013. (More details about the photo contest will be forthcoming; categories and deadline will change.)

The magazine staff is excited about the new format and the opportunity to better serve our loyal subscribers who have supported the magazine over the past 73 years. We ask for your patience as we move forward, and trust that the new and improved *Virginia Wildlife* will continue to find a spot by your favorite reading chair.







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